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MECHANISM AND METHOD FOR PRODUCING CUSHIONING DUNNAGE

George R. Johnson, Chagrin Falls, Ohio, assignor to The Arpax Company, Chagrin Falls, Ohio, a corporation of Ohio

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12 Claims

ABSTRACT OF THE DISCLOSURE

A cushioning dunnage-producing mechanism comprising a support for a plurality of rolls of sheet-like stock material, with the sheets of such stock material disposed in superimposed relation and fed into a crumpler section of rectangular-shaped tubular construction, to compress the sheet-like material into a pad-like configuration of dunnage product. The lateral edges of the sheet-like material are rolled inwardly into spiral-like form prior to passage of the stock material into the crumpler section, and meshed spur gears coin or stitch the confronting portions of the rolled edge sections of the stock material together, to hold the dunnage product in a pad-like configuration possessing high resiliency. A cutter mechanism is provided for cutting the pad into the desired lengths. The finalized pad comprises highly resilient pillow-like lateral portions, and a compressed or coined central section of lesser resiliency as compared to the lateral portions.

This invention relates in general to mechanism for producing packing material or cushioning dunnage as it is known in the art, and more particularly a dunnage-producing mechanism for producing a continuous, resilient, pad-like dunnage product from sheet-like material, such as paper. The novel pad-like dunnage product has a relatively low density per unit volume, and can be rapidly produced on the machine of the invention. The invention also relates to a novel method for producing pad-like cushioning dunnage.

Various mechanisms are known in the art for producing lengths of packing material for use in packaging breakable items in enclosing containers. One such mechanism is disclosed in U.S. Patent 2,882,802, issued Apr. 21, 1959 to Charles Robert Walker and entitled "Crumpling Device." The dunnage product produced on the machine of the present application possesses substantially greater cushioning resiliency for providing adequate cushioning protection. Various other dunnage producing mechanisms are disclosed in applicant's copending U.S. patent application Ser. No. 640,145 filed May 22, 1967.

The present invention provides a novel mechanism for expeditiously producing from preferably a plurality of webs of sheet-like material, such as paper, a pad-like cushioning dunnage product having good resiliency and which dunnage product is of a relatively low density per unit volume. The invention also provides a novel method of producing packing material, and a novel cushioning dunnage product of resilient pad-like configuration. The user is able to convert paper from rolls having densities of for instance of 40 to 50 pounds per cubic foot, requiring relatively little storage space, into cushioning dunnage having densities of for instance of one to two pounds per cubic foot, and as needed for direct placement into a package at a packaging station.

Accordingly, an object of the invention is to provide a novel mechanism for producing dunnage or packing material.

Another object of the invention is to provide a mechanism of the latter type which utilizes a plurality of webs

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of sheet-like material and forms such webs of material into a pad-like cushioning dunnage product of relatively low density per unit volume.

A further object of the invention is to provide the mechanism of the character described in which the lateral edge portions of the sheet-like material are urged into generally spiral or rolled form, in cross section, and then the sheet-like material is drawn generally horizontally through a crumpler section of the mechanism by means of meshed gears which grip the crumpled rolled edged sheets of material generally centrally thereof and stitch the rolled edge portions of such sheets together to provide a unitary pad-like cushioning dunnage product.

A further object of the invention is to provide a novel method for producing a resilient cushioning dunnage product of generally pad-like configuration comprising rolling the edges of sheet-like material inwardly to form generally spiral portions, compressing the rolled edged sheet-like material together into generally pad-like configuration, and connecting together the abutting generally centrally-disposed mating areas of the crumpled pad, to maintain the pad-like configuration while preserving the resilient characteristics of the crumpled sheet material.

A still further object of the invention is to provide a novel dunnage product of relatively low density per unit volume and in a pad-like configuration with connecting means extending lengthwise of the pad.

Other objects and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a generally diagrammatic top-plan view of the mechanism of the invention;

FIG. 2 is a side-elevational view of the mechanism illustrated in FIG. 1;

FIG. 3 is a sectional view taken generally along the plane of the line 3—3 of FIG. 1 looking in the direction of the arrows;

FIG. 4 is a fragmentary view taken generally along the plane of 4—4 of FIG. 2 looking in the direction of the arrows, and illustrating the pusher means which aids in rolling the edges of the sheet-like stock material into spiral-like configuration prior to movement of the rolled-edged stock into the crumpling section of the mechanism;

FIG. 5 is a fragmentary generally diagrammatic top-plan view of the cushioning dunnage product produced by the mechanism;

FIG. 6 is a sectional view taken generally along the plane of line 6—6 of FIG. 5 looking in the direction of the arrows;

FIG. 7 is a fragmentary, perspective view illustrating the rolling of the edges of the sheet-like stock material above the pusher;

FIG. 8 is a diagrammatic end-elevational illustration of the generally spirally-rolled sheet material just after it has passed the pusher means of FIG. 7; and

FIG. 9 is a diagrammatic generally end elevational, fragmentary illustration of the superimposed webs of sheet-like material with their lateral edges rolled into generally spiral form, converging into the crumpler section of the mechanism for producing the pad-like construction of dunnage product.

Referring now again to the drawings, there is illustrated a plurality of rolls 10 and 12 of sheet-like or web-like material, rotatably mounted on a support 14, for feeding of the sheet-like material lengthwise of the dunnage-producing machine. The sheet-like material may be of any suitable type, with paper, such as 30 pound kraft paper, having been found to be satisfactory. However, it will be understood that other types of papers and other sheet-like materials may also be satisfactory, the kraft paper having been found to provide a particularly expeditious type of cushioning dunnage product.